ATOMIC ENERGY Newsletter

THE FIRST AND ONLY

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Dear Sir:

Bills to amend the Atomic Energy Act were introduced into both Houses of Congress last week by Rep. W. Sterling Cole, chairman, Joint Congressional Committee on Atomic Energy, and Sen. B. B. Hickenlooper, vice-chairman. Main provisions of these bills were: (1) The USAEC would be allowed to give to the Allies of the United States information necessary to development of defense plans and the training of personnel in the use of and defense against various nuclear weapons. (This would not include information on the design or manufacture of these weapons.) (2) The USAEC could also give these Allies data on industrial and other applications of nuclear energy for peaceful purposes, as well as fissionable materials for industrial and research use. This would allow the formation of the international pool of atomic materials for peaceful purposes, as proposed by President Eisenhower before the United Nations last December. (3) Private industry would be allowed to own and operate nuclear reactors, and permitted certain rights now denied regarding these reactors, and associated activities under USAEC regulation, in an attempt to create a new industry in atomic energy.

A group of study agreements looking toward the practical application of atomic power and its by-products have now been made between three United States firms and the USAEC. In one agreement, the Babcock & Wilcox Co., will concentrate on the design, development, and manufacture of equipment necessary to the operation of nuclear power plants. (This company recently established an atomic energy division with 40 employees, most of them engineers, to carry on the work of this project, as well as other work related to the U.S. atomic energy program.) In another agreement, Bendix Aviation Corp. will conduct a study of the future of atomic power and by-products, anticipating the development of new nuclear reactor designs and the discovery of new uses for radioactive isotopes or fission products. (Bendix has already made 4 reports to the USAEC on small nuclear reactor power plants, and one report on the commercial utilization of radioactive isotopes.) The last agreement made was with American Machine and Foundry. That firm will make a study of machines and equipment associated with nuclear power plants, and will explore the feasibility of developing low power nuclear reactors for industrial research. (Much of the atomic energy experience of this firm has been in the development and manufacture of control mechanisms.) These three new projects will run for one year; the firms involved will bear all costs. (Additional BUSINESS news, page 4 this LETTER.)

The outlook for future discoveries of uranium minerals is bright, particularly in the Rocky Mountain states, V.E. McKelvey, of the U. S. Geological Survey, told a meeting of the Society of Exploration Geophysicists, in St. Louis last week. Mr. McKelvey observed that the search for uranium in the United States is one of the most intensive ever made for any metal in this country's history. He said that while the number of prospectors and miners involved is difficult to estimate, some idea of the size of the effort is indicated by the fact that about 500 geologists are employed by the Government and industry in the work.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America, $20.00 a year. All other countries, $25.00 a year.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear lab & plant...

MANUFACTURER'S PRODUCTS: Medical instrument for scanning body areas and producing a graph of isotope concentration; particularly recommended by the manufacturer for showing Iodine-131 distribution in the thyroid gland. The equipment includes a sensitive collimated scintillation detector; a mount for the detector which is motorized to provide vertical movement; a scanning device to move the detector over the portion of the body being scanned; a scaler and power supply for the detector; a printing device to record the radioactivity distribution; and a wheeled table which carries all this equipment and is designed to straddle a hospital bed or examination table. The standard scanner will cover an area 15"x15", has adjustable speed back and forth across the bed, and adjustable spacing between scans. --Tracerlab, Inc., Boston 10, Mass.

PROCESSES: Use of a cation exchanger to remove radioactivity from water and waste was recently described at the 125th national American Chemical Society meeting in Kansas City, by H. Gladys Swope, Argonne National Laboratory. In the work, which was done with Elaine Anderson of International Minerals, it was found possible to remove 75 to 80% of beta-gamma activity using a sulfonic acid type of cation exchanger. The capacity of the resin used was greater than 250,000 gal. per cubic foot, while the theoretical capacity was 6000 gal. per cubic foot for tap water containing 300 p.p.m. of total solids and 85 p.p.m. of total hardness as calcium carbonate. It is believed that a practical application may be found in treating low level wastes since no evaporation is necessary, and the contaminated resin can be burned.

EXPERIMENTAL WORK: A small, inexpensive, and portable X-ray unit, utilizing radioactive thulium, which has potential uses in medicine and industry, has been developed at Argonne National Laboratory (Chicago) and is being tested as a diagnostic unit by the Laboratory. In the Argonne development, which was directed by Samual Untermeyer, the thulium is mounted in a source holder and shield, equipped with a shutter mechanism, so that X-ray photographs may be made. The apparatus is simple, inexpensive, and readily portable (weight is 10-lbs.) It is estimated that the radioactive thulium provides energies comparable to a 100,000 volt X-ray tube. The laboratory estimated that its cost for the first model, exclusive of irradiation charges, was $40. The use of thulium was first suggested by British physicists who had developed a similar instrument. Industrial uses suggested are as a device for the determination of levels and densities of liquids in closed systems. The thulium used was from the Ames Laboratory, Iowa State College, where Dr. Frank Spedding has pioneered in the separation of rare earth elements.

The NRX reactor at Canada's Chalk River, Ontario, establishment, now operating after a 14-month shut-down, is operating at 40,000 kilowatts. Its highest attained power before it went out of commission was 30,000 kilowatts. The NRX reactor, which first went into operation in 1947, was designed for steady operation at 10,000 kilowatts, with provision to extend this to 20,000 kilowatts if this proved practicable. The power output has increased as modifications have been made over the years. The latest modification could not have been made without dismantling the reactor.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Introduction to Nuclear Engineering, by R. L. Murray. Devotes chapters to problems in the fields of radiation hazards, radioactive waste disposal, shielding, and reactor control instruments. 418 pages.--Prentice-Hall, Inc., New York 11. ($7.00)

Protection Against Betatron-Synchrotron Radiations up to 100 Million Electron Volts. Recommendations made by the National Committee on Radiation Protection as they apply to high energy electron accelerators of the betatron and synchrotron types. (NBS Handbook No. 55). The protection requirements for operating people, hospital patients, and the public against the potential hazards of the accelerators are outlined. --Superintendent of Documents, Wash. 25, D. C. (55¢)

Radioactivity and Radioactive Substances. By Sir J. Chadwick; fourth edition, revised and supplemented by J. Rotblat. This book, first written in 1921, may be used as a primer for those interested in this subject, or as an introduction to a general study of nuclear physics. 120 pages. --Sir Isaac Pitman & Sons, Ltd., London, England. (12s. 6d.)

RAW MATERIALS...radioactive mineral & ore development...

UNITED STATES: Earnings of Climax Uranium Co. were $428,248 for the second half of 1953, the annual report of Climax Molybdenum, parent concern, has revealed. Climax also acquired several thorium prospects during 1953. Meanwhile, Carroll L. Wilson, who had been president of Climax Uranium, has now been made director of industrial development of Climax Molybdenum, it was announced last week. Mr. Wilson had been general manager of the USAEC before coming to Climax. John H. White, Jr., has been elected to succeed Mr. Wilson as president; this presidency has been made a full-time job, with headquarters at Grand Junction, Colo.....A newly organized Denver company, the Platoria Uranium Corp., is now developing a property with uranium occurring in veins of meta-autunite, rather than in deposits of carnotite, as is most common. The property is located 70 miles northwest of Winnemucca, Nev., in the Kings River Valley of Humboldt county. Some two carloads of ore have been sent to a Salt Lake City processor and are reported to have assayed satisfactory uranium percentages.....A uranium rush is now centering on the village of Harper, in Malhew county, 45 miles southwest of Ontario, Oregon. First reports are that "traces" of uranium are being found, with no substantial finds reported to date.

CANADA: Molybdenum Corp. of America feels that its Oka area uranium property could add substantially to that firm's earning power, Marx Hirsch, president, states in the company's annual report. Concerning this Oka operation, which is near Montreal, Mr. Hirsch states that considerable radioactivity and mineralization has been disclosed at the property.....Chimo Gold Mines completed some 20,000-ft. of diamond drilling on its main uranium property in the Lake Athabaska area in the past year, the firm's annual report states. At this Athabaska property, which adjoins Gunnar Uranium on the north, a scintillation counter survey and surface prospecting showed more than 100 occurrences of above normal radioactivity, it is stated.....And on the financial side: The last fortnight saw the 6,000,000 authorized shares of Algom Uranium Mines admitted for trading on the unlisted section of the Canadian Stock Exchange in Montreal.

IONIZING RADIATION & RADIOISOTOPES...news and notes...

To Combat Radiation Injury: A "spleen protective factor", which was found to combat radiation injury in mice, was described before a recent meeting in Kansas City of the American Chemical Society, by R. K. Mains, chief radiological chemist, U.S. Naval Radiological Defense Laboratory, San Francisco. L.J. Cole, and V.P. Bond were co-authors of the paper. The report concerned a continuation of research initiated in Chicago where it was learned that the spleen of young mice contains a factor (or factors) which protects mice against the effects of lethal doses of X-rays when given after irradiation. The research, Mains stated, was undertaken to discover the biochemical systems in the body which are sensitive to X-rays and which respond to treatment by suitable preparations of the spleen protective factor. It was found, he said, that the biochemical process necessary for the production in the body of new tissue cells, when depressed by X-rays, is stimulated to recover by the post-irradiation administration of a spleen protective factor.

For Medical Research: Colchicine, tagged with radiocarbon, has been used by researchers of the University of Chicago in showing chemical differences between cancer patients and normal individuals, according to a paper delivered last fortnight before the Federation of American Societies of Experimental Biology, meeting in Atlantic City. The paper was presented by E. J. Walaszek, who discussed experiments conducted by himself, G. V. LeRoy, and E.M.K. Geiling. In the experiment, 11 individuals were given small amounts of radioactive colchicine. Six of the persons tested were cancer patients in an advanced stage. Of the other five, two suffered from gout. (Colchicine has been used in the treatment of gout, and is being studied for use on cancer; its action is to inhibit cell division.) After administration of the colchicine, breath and urine samples were checked to determine how the drug was disposed. It was found that in the cancer patients 0.2% to 6% of the colchicine was excreted in an unchanged form. However, in the non-cancer patients, the range was from about 15% to 50%. The gouty patients showed low unchanged secretion, but broke the colchicine down into different chemical by-products than did the cancer patients.

BUSINESS NEWS...in the nuclear field...

CONTRACTS AWARDED AT REACTOR TESTING STATION: Arrington Construction Co., Idaho Falls, has been awarded by the USAEC a $2,021,200 contract for second phase construction of ground testing facilities for a prototype aircraft propulsion reactor at the National Reactor Testing Station, Idaho Falls. Arrington's bid was the lowest of 10 submitted. The initial phase work was done under a $4,600,000 contract by Utah Construction Co., Salt Lake City, which covered construction of an assembly and maintenance area and an administration area. The new contract of Arrington covers construction of buildings and service facilities for the initial engine test area of the project. Construction of these ground test facilities is being done at the same time research and development work is being carried on by General Electric's aircraft nuclear propulsion department at Cincinnati, Ohio. (General Electric will also operate the facilities at the station.) Architect-engineer firm for the project is the Ralph M. Parsons Co., Los Angeles.

A cost-plus-fixed-fee contract for the construction of modifications to the chemical processing plant at the National Reactor Testing Station has been awarded J. F. Pritchard & Co., Kansas City, Mo., by the USAEC; some 31 firms were considered for the job. The engineering and design of these modifications are being done by the chemical plants division of Blaw-Knox Co., Pittsburgh. The plant, which is used in the reclamation of "unburned" uranium-235 from used reactor fuel elements, and which started the processing of irradiated fuel elements in January, 1953, is operated under a prime USAEC contract by Phillips Petroleum Co., Bartlesville, Okla.

NEW POWER REACTOR STUDIES APPROVED: A new phase of nuclear power investigations involving actual experiments and preliminary engineering with a breeder reactor is to be started by the Dow Chemical-Detroit Edison industrial study group, under approval recently granted by the USAEC. This Dow-Detroit Edison group includes 26 associated firms or groups of firms which have been studying nuclear power technology since the USAEC's industrial participation program began in 1951. The group's new program will involve spending an estimated $2,300,000 on a detailed program of research and development on a breeder reactor for the generation of electrical energy and the production of other products, and on related equipment and processes. This new arrangement will run until January 31st, 1955; the group is required to submit a report to the USAEC advising on the desirability of further work on a nuclear reactor suitable for commercial production of economic electrical energy. The report also is to state the proposed contribution and plans of the group for the development, design, construction and operation of such a nuclear reactor. Companies and groups associated with Dow Chemical and Detroit Edison in this project are: Allis-Chalmers; Atlantic City Electric Co.; Babcock & Wilcox; Bendix Aviation; Cincinnati Gas & Electric; Cleveland Electric Illuminating Co.; Consolidated Edison (New York); Consolidated Gas, Electric Light and Power (Baltimore); Consumers Power; Ford Motor Co.; General Public Utilities Corp.; Gibbs & Cox; Hartford Electric Light; New England Electric System; Niagara Mohawk Power Corp.; Philadelphia Electric Co.; Potomac Electric Power Co.; Public Service Electric & Gas Co.; Rochester Gas & Electric; Southern Services, Inc.; Toledo Edison; United Engineers & Constructors, Inc.; Vitro Corp. of America; Wisconsin Electric Power Co.

SITE SET FOR FIRST PLANT TO PRODUCE COMMERCIAL NUCLEAR POWER: The site has now been selected for the electric utility plant which Duquesne Light Co will construct and which will use a nuclear reactor as a heat source: it will be on a 400 acre plot in Shippingport Borough (Pa.) in Beaver County, on the south bank of the Ohio river. Duquesne's board chairman, Philip A. Fleger, said the site had adequate cooling water, suitable transportation, and that the property already had transmission facilities into which the plant's output could be connected.

NUCLEAR POWER DISCUSSED: The operating cost of an electric utility producing power by nuclear means must be under 5 mils per kw.-hr., R.L. Doan, Phillips Petroleum (atomic energy division) told the 16th annual American Power Conference, held recently in Chicago. The cost of such plants must be kept under $200 per kw., Mr. Doan stated, and he observed that most present nuclear reactor designs fall outside these limits. For this reason, he said, the realistic approach to the power reactor means consideration of revenue sources other than electric power: sale of fissionable material, radioactive isotopes, irradiation services, etc.

ATOMIC PATENT NEWS...latest U. S. grants...

Determination of the level of a body of material in a vessel. Comprises (in part) apparatus for indicating the level of such material passing continuously through a vessel between its upper inlet and its lower outlet. Several sources of ionizing radiation are utilized, spaced apart and located in fixed and close relationship to the vessel wall. The level is determined by a counter (located above the plane of the uppermost source) activated in proportion to the total number of radiations emitted by the sources. U.S. Pat. No. 2,674,695 issued Apr. 6, 1954; assigned to Sun Oil Co., Phila., Pa. (Inventor: E. J. Grace, Jr.)

Beam defining apparatus; for use in the evacuated output tube of a high energy particle accelerator. Comprises (in part) a mounting block through which the high energy beam is transmitted, collimating means mounted on this block, with these means including independently movable elements for shaping the beam in either of two directions as it passes therethrough. U.S. Pat. No. 2,674,698 issued Apr. 6, 1954; assigned to United States of America (USAEC). (Inventors: J.L. Danforth and L.R. McIntosh)

Preparation of uranium tetrafluoride. Comprises (in part) reacting an oxide of uranium with a fluorochlorocarbon at a temperature within the range of from about 350 deg. C., to about 700 deg. C., and recovering the uranium tetrafluoride produced. U.S. Pat. No. 2,674,518 issued Apr. 6, 1954; assigned to United States of America (USAEC). (Inventors: E.C. Evers and M.B. Reynolds.)

Radioactivity detecting apparatus. In such apparatus, the combination comprising (in part) several radiation detectors having different starting potentials, with electronic circuitry (including a D.C. source interposed in said circuit) facilitating adjustment of the amplitude of the potential of this source to values corresponding to the different starting potentials of the radiation detectors to render these detectors selectively operable. U. S. Pat. No. 2,674,699 issued Apr. 6, 1954; assigned to Schlumberger Well Surveying Corp., Houston, Tex. (Inventor: F. S. Phillips.)

Gauge for determining the level of material in a vessel. Comprises (in part) a source of gamma radiation of an activity between 5 and 50 millicuries, and a scintillating phosphor, so arranged that an electrical circuit may measure reflected radiation pulses from the wall of a vessel and the material in it. U.S. Pat. No. 2,675,478 issued Apr. 13, 1954; assigned to Isotope Products, Ltd., Oakville, Ont., Canada. (Inventors: D.C. Brunton and N.Z. Alcock.)

Gamma ray radiography apparatus, for examining specimens of a mass between about 0.1 and 30 gm./sq.cm. Comprises (in part) a radioactive isotope having a greater amount of low energy gamma radiation than high energy gamma radiation, a screen for converting the energy of this radiation to a visible image, and shutter and a beta radiation filter between the source and the screen. U.S. Pat. No. 2,675,479 issued Apr. 13, 1954; assigned to Isotope Products, Ltd., Oakville, Ont., Canada. (Inventors: P.J. Stewart and N.Z. Alcock.)

Improvement in geological prospecting. Comprises (in part) determining the intensity of gamma radiation from earth masses corresponding to each of several locations by detecting substantially the same number of counts from each such mass and measuring the time required for each such number of counts to accrue, thus subjecting each intensity measurement to the same probable statistical error. U.S. Pat. No. 2,675,480 issued Apr. 14, 1954; assigned to The Texas Co., New York, N.Y. (Inventor: G. Herzog.)

Borehole radioactivity system utilizing radio signal transmission. In a method for transmitting to the earth's surface a signal output generated by apparatus in a borehole, the steps of generating in the bore hole an electromagnetic wave having a wavelength comparable with the borehole diameter, modulating this wave as a function of the signal output from the apparatus, and utilizing the bore hole as a wave guide for propagation of this modulated wave to the surface. U.S. Pat. No. 2,675,481 issued Apr. 13, 1954; assigned to Schlumberger Well Surveying Corp., Houston, Tex. (Inventor: S. Krasnow.)

Sincerely,

The Staff,
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